

Appl. No. 10/671,359
Amdt. dated March 12, 2008
Reply to Office action of November 15, 2007

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REMARKS/ARGUMENTS

In response to the Examiner's Office Action of 15 November 2007, Applicant is herein presenting his considerations in response to the Examiner's comments.

Referring to the Examiner's claim objections, the Applicant has made amendments to correct the dependency issue. Regarding the objection to prior claim 23, Applicants respectfully submit that the Examiner has incorrectly interpreted the paragraph in question. Applicants confirm that it is, in fact, the said at least one linked entity that contains the plurality of conceptual entities. Accordingly the phrase in question remains unchanged. Amendments have been proposed to amend claims 23 and 24 to address the Examiner's objections under 35 USC§112 & 35 USC§101. New claims 25 through 27 have been added.

Based on 35 USC § 112 first paragraph, Examiner has commented that there is a failure to comply with the enablement requirement, the Examiner indicated that the subject matter was not described in the specification specifically enough to enable one skilled in the art to make use of the invention.

Examiner then indicated that where "means plus function language" is used to define the characteristics of a machine or manufacture invention, such language must be interpreted to read on only the structure or materials disclosed in the specification and "equivalents thereof" that correspond to the recited function. The following comments will address this matter.

In this regard Applicants would first refer Examiner to Applicant's Fig. 1 where there is seen the hardware module for practicing the invention --- and the later descriptions in the specification of how the modules are used..

For example at page 15 of the specification at lines 27 through 33 there is indicated the use of a Microsoft SQL server database running on a standard Intel Pentium III 1 GHz PC running Microsoft Windows XP. Here is a solid example of the one implementation. Applicant's show a physical embodiment which could teach a skilled computer engineer the substance of the type of modules which can be used to implement the invention. Then as seen on page 1 lines 18 onward --- "generally, a database structure may be composed of a number of "entities", each entity being arranged to hold a set of data

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values, then here are shown various types of entities and data values as described.

Therefore, Applicant's Fig. 2 and Fig. 3 illustrate actual entities used in the system.

The specification at page 2 line 14 onward --- in practice, databases are generally arranged in the form of a set of tables, each table being arranged to hold a set of data. In one particular embodiment, a term "relational" database, elements in one table are linked to elements in another table---

Then the discussion in the specification continues from the bottom of page 2 to indicate how the data in the table will be queried to retrieve values held in a database. This is known as the "read" operation. Following that, Page 3 of line 4 onward, there is a discussion of the write operations.

In the specification at page 9 line 4 onward actual physical hardware is described:

the computing system 10 preferably complies with the processor 12, read-only memory (ROM) 14, random access memory (RAM) 16, and input/output devices such as disk drives 18, keyboard 22, mouse 24, display 26 and printer 28. The computer includes programs that can be stored in RAM 16, ROM 14 or disk drives 18 and may be executed by the processor 12 -- and then further is the discussion that illustrates types of disk drives which can be used.

At page 14 line 26 onward, there is a description of calculated steps to determine the critical read/write ratio.

At page 16 the database schema was shown in connection with Fig. 3 in addition showing the population of various tables.

At page 17 of the specification there is shown various calculations necessary to determine the timing factors involved for read/write ratios.

The Examiner apparently has a query as to what are the "means" involved in the claims 23 and 24.

Applicants would indicate that these means are provided for in Figs. 1 - 3 of the drawings in addition to the above cited references from the specification which are quite available and knowledgeable to a skilled engincer who works in the modern computer arts.

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Thus Applicants do not feel that any more implementation factors are necessary other than those in the specification and which would be sufficient for a skilled engineer to apply and practice the invention.

In regard to Examiner's objections under 35 USC §101 as the claims being construed merely as software per se --- Applicants have amended the claims to indicate the physical attributes involved which are used to implement the computer program. As such, now it will be seen that the claims show "acts" being performed. Thus with the presently amended claims, it will be understood from the language that they are physical modules and physical elements involved.

Turning to the substantive objections taken to the claims under §103(a), Applicant respectfully disagrees with the Examiner's assertion that the claimed invention is obvious in light of *Krychniak* when combined with both Prabhakaran et al and Tenorio. Applicants would traverse the applicability of Section 103(a).

Applicant submits as a first point I that the Examiner is still incorrectly equating certain features present within the cited reference documents to other features of the claimed invention (and thus incorrectly coming to the conclusion that the cited reference documents, in combination, teach of each and every feature of the claimed invention). The references do not teach each and every feature of Applicant's configuration.

Moreover, Applicant contends as a second point II that there is insufficient teaching, suggestion and motivation for the Examiner to combine each of the cited references in order to maintain such an obviousness objection.

I. With regards to the first point, and having specific regard to *Krychniak*, Applicants again submit that there is no explicit teaching anywhere in *Krychniak* of defining an additional entity table which stores an aggregation of data values (i.e. not merely pointers or keys to other tables positioned within the database structure) representing an aggregation of at least one of the plurality of conceptual entities (i.e. entities pre-existing within the database).

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After reading the *Krychniak* disclosure numerous times, the Applicant cannot understand how the "Field" table taught in *Krychniak* can be equated to the "additional table" of the presently claimed invention.

The Field table taught in *Krychniak* is not operable to store an aggregation of data values representing an aggregation of at least one of the plurality of conceptual entities, but instead stores only arbitrary identifiers (i.e. not actual data values) given to the various other entities, for "space efficiency" (see *Krychniak* column 1 lines 25 to 47). In other words, as the field table only holds key values, a user wishing to retrieve data values from the database is still required to perform computationally expensive join operations in order to retrieve the subject data. Therefore the disclosure of *Krychniak* cannot provide the advantage of the claimed invention, namely the more efficient retrieval of data values from the database. Applicant requests that if the Examiner is to maintain his objection, he clearly point out the descriptive support in *Krychniak* that teaches the fact table being arranged to store an aggregation of data values created responsive to determining that the performance of the database could be improved (expressly required by the method steps of the presently claimed invention).

Further, and with regards to *Prabhakaran*, the Applicant is puzzled as to how the cited passages explicitly teach of interrogating the database to determine the read/write ratio of the plurality of data values and comparing the determined read/write ratio with other ratios.

Again, the Applicant has carried out a detailed review of the cited passage of *Prabhakaran* but could not find any teaching of interrogating the database to determine read/write ratios (let alone in the context of comparing the determined ratio against a critical ratio to decide whether or not to create an additional table).

In complete contrast, the cited passages (of Prabhakaran) teach of setting a read/write ratio (see column 5 lines 51 to 55) and initiating a plurality of operations (capable of achieving the set ratio) to the database storage system to test whether the system is capable of handling the set read/write ratio. This may involve

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inspecting the number of read and write operations attempted by the database storage system, the number of operations completed, etc (see column 7, lines 59 to 66). Furthermore, the Applicant could not locate any explicit teaching of comparing a read/write ratio to another ratio. To reiterate:

Prabhakaran shows no teaching of "comparing" one read/write ratio to another read/write ratio.

II. Turning to the second point, Applicants note that the ground for obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. Applicants submit that there is no such teaching, suggestion or motivation present in the cited references which would work for engineering compatibility without undue experimentation. Substantial redesign and reconfiguration would be required to enable any such combination suggested by the Examiner.

Krychniak relates to a system/method for improving the performance of a database by choosing the most efficient query structure depending on the actual attributes to be queried. For example, the system may choose to query on a key value rather than an attribute value if the number of key values which appear in the query is less than a predetermined threshold. *Krychniak* does not teach or suggest of creating an additional entity table responsive to determining that an average read/write ratio of the database is greater than a critical read/write ratio. In fact, in no way whatsoever does *Krychniak* suggest modifying the database structure (i.e. defining an additional entity table storing an aggregation of a plurality of data values representing an aggregation of at least one of the plurality of conceptual entities).

In and of itself, Applicants submit that the mere fact that *Krychniak* fails to disclose creating an additional entity table (or, in fact, modifying the pre-existing database structure in any manner) to improve performance provides sufficient basis for the Examiner to withdraw his obviousness objection.

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Nonetheless, for completeness, assuming that *Krychniak* did teach of creating an additional entity table, Applicants submit that there would have been insufficient motivation for the relevant skilled person to have looked to *Prabhakaran et al* and *Tenorio* given that:

- (a) neither reference suggests of utilising read/write ratios (including a critical read/write ratio) in any manner to establish whether or not to create additional entity tables for improving the performance of the database; and
- (b) both *Prabhakaran et al* and *Tenorio* are both directed to overcoming entirely unrelated problems:

Tenorio is solving the problem of large databases structures being difficult to search due to a lack of indexing (see *Tenorio* Column 4 lines 21 bridging to Column 5 line 20); and *Prabhakaran et al* is addressing problems with conventional load testing tools being unable to directly measure the performance of an enterprise storage system (see *Prabhakaran* Column 1 line 64 bridging to Column 2 line 18).

Arguably, both *Tenorio* and the presently claimed invention both teach of a read/write ratio calculated by determining a read time and write time difference between a first implementation and second implementation. However, according to *Tenorio* the read/write ratio is not utilised to determine whether or not to alter the fields or schema of the database for improving efficiency (i.e. defining an additional entity table storing an aggregation of data values distributed amongst at least one set of linked entities), but instead is merely used to determine whether or not to index the database.

See, for example, *Tenorio* Column 19 lines 53 to 55 which explicitly states:

"the total read times and total write times with and without indexing are evaluated to determine whether the fields associated with the selected feature should be indexed".

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As Tenorio does not teach or suggest of modifying the fields or schema of the database to improve efficiency, there would be no reason for a person skilled in the art to look to Tenorio for determining a "critical read/write ratio".

Then note Tenorio at column 20 at claim 1 at the last clause (lines 29 – 31):

----- *evaluating the total times required for reading data from
and writing data to the fields to determine whether the fields
should be indexed* -----

This factor is expressed also in the Tenorio Abstract in the last three lines.

For at least the reasons outlined above, Applicant submits that the claims are non-obvious in view of *Krychniak* when combined with both *Prabhakaran* et al and *Tenorio* and accordingly, Applicants request that the objection be withdrawn.

It should be further indicated that when the Examiner combines references such as *Krychniak*, *Prabhakaran* and *Tenorio*, the combination must present a fully workable apparatus or system which can be operable without undue experimentation. Thus the Examiner should recognize the substantial engineering redesign, reconfiguration, experimentation and testing required to integrate the features of *Krychniak*, *Prabhakaran*, and *Tenorio* into a workable system to integrate these references to provide the equivalent features of Applicant's system. --- and the cited references never even teach the feature of "comparing" one read/write ratio with another critical read/write ratio, as provided by Applicants in determining whether to alter the fields of the database format..

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Conclusion

Applicant submits that all of the Examiner's objections have been addressed and respectfully requests allowance of the extant claims.

Respectfully submitted,

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Dated March 12, 2008

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